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ABSTRACT

To examine the issue of item bias within the context of the revised Wechsler Adult Intelligence Scale (WAIS-R), judgments as to perceived item bias were sought. Independent raters nominated 53 WAIS-R items as containing possible bias. White and non-white college students nominated items as racially or sexually biased. Whereas 10 items were judged as biased by the students, only one indicated differential performance by sex and six by race. The implications of the results for test construction are discussed. (Author/CM)

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Sex and Race Bias in the WAIS-R:A Content and Empirical Analysis

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Abstract

Independent raters nominated 53 WAIS-R items as containing possible bias. White and non-white college students nominated items as racially or sexually biased. Whereas 10 items were judged as biased by the students, only one indicated differential performance by sex and six by race. The implications of the results for test construction are discussed.

Sex and Race Bias in the WAIS-R: A Content and Empirical Analysis

Users of Wechsler's (1981) revision of the Wechsler Adult Intelligence Scale (WAIS) may note that the modifications of the test resulted in the inclusion of items which tend to be cultural samples reflecting, occasionally, what one may speculate to be of black or feminist content. Examples include "Who was Martin Luther King?" for the former and "What was Marie Curie famous for?" for the latter. One suspects that such modification may have been specifically addressed to criticisms which attempt to attack intelligence tests at the level of the content of individual items. Such critics frequently ridicule the content of tests as being irrelevent to certain groups and biased in favor of some others. A difficulty with such criticisms is that items perceived as content biased may evidence no empirical bias rendering the criticisms ridiculous. For example, Sandoval and Miille (1980) found that Mexican-American, black and white judges were unable to determine which WISC-R items were more difficult for minority children. In fact Sandoval (1979) reports that there is no clear pattern to the item level pattern for minority children and suggested that differences between minority and majority groups do not occur at the item level.

The current study sought to examine this item bias issue within the context of Wechsler's revision of the WAIS, the WAIS-R. Revisions may not necessarily mean improvement for minority groups, as Mumford, Meyerowitz and Mumford (1980) found with the WISC-R as

compared to WISC performances of minority children, so an investigation of the WAIS-R is warranted. In our study, judgements as to perceived item bias by blacks and whites as well as by males and females were sought. This rational (subjective) approach was compared with quantitative (empirical) results. Thus the present study sought to establish the items perceived as race or sex biased on the WAIS-R, and to assess whether, when administered, that this was indeed the case.

Method

Subjects. The item nominators were the two coauthors, one a Ph.D. and the other a Master's level psychologist. Both were white, one a male, the other a female.

The subjects for this study were 400 undergraduates enrolled in introductory psychology who received credit for the course's experimental requirement. The subject included 98 blacks, 300 whites; 84 males and 243 females. Certain of the participants failed to indicate either sex or race on the experimental form.

Materials and Procedure. The two raters discussed the criteria for item inclusion in the study, namely, the possibility that such items may be perceived as biased, limiting themselves for the purpose of the study to only Verbal subtest items. WAIS-R manuals were then independently analyzed and items nominated.

Items which both raters nominated were presented on a form which explained the nature of the study and asked the subjects to identify those items which were biased against or in favor of blacks, or whites; males or females. In addition the subjects were asked to answer the questions in a space provided. Those questions which greater than 25% of any sex by race group

(eg., white females) felt were biased were then retained for analysis for evidence of empirical bias.

Item responses were scored according to standard scoring criteria and the response frequency of correct and incorrect response tabulated. Two by two Chi-squared analysis tested for the differential performance of males versus females, and blacks versus whites by the items analyzed.

Results

Table 1 presents the results of the item nomination procedure. The clinicians nominated 53 items of the 108 possible in the Verbal subtests excluding Digit Span. The largest number of items were nominated for Information and Vocabulary at 15 comprising 51 and 43 percent of their respective subtests. Arithmetic had 7 (50%), Comprehension 9 (56%) and Similarities 7 (50%).

The student rating of the item resulted in ten of the 53 items attaining the criteria of 25% of a sex by race group judging an item to be biased. Nine were from Information and one from Vocabulary with none chosen from the Arithmetic, Comprehension, and Similarities subtests. Of the items nominated, three I-8 "Who was Louis Armstrong?", I-13 "Who was president during the Civil War?" and I-17 "Who was Martin Luther King?" were rated as biased in favor of blacks; three were rated as biased in favor of females, I-21 "How does yeast cause dough to rise?", I-16 "What was Marie Curie famous for?" and V-7 "Fabric"; two were rated as being in favor of whites, I-12 "Who wrote Hamlet?", and I-18 "What is the main theme of the book of Genesis?"; one in favor of whites and females I-14 "Who was Amelia Earhart?"; and one paradoxically in favor of both blacks and whites, I-15 "Why are dark colored

clothes warmer than light colored clothes?"

Insert Table 1 About Here

Table 2 lists the percent males and females passing and failing the ten nominated items. Only one item I-8 (Armstrong), showed a differential rate of passing ($Chi^2=6.29$, df=1, $p<.05$) The other items indicated no significant difference in the preparation of males and females passing the item.

Insert Table 2 About Here

Table 3 lists the percent blacks and whites passing and failing the ten nominated items. Six showed a differential rate of passing with five showing a higher proportion of whites passing, I-12 (Hamlet), I-13 (President during Civil War), I-14 (Earhart), I-15 (Clothes), and I-21 (Yeast); and with one showing a higher rate of endorsement by blacks I-17 (King).

Insert Table 3 About Here

Discussion

First the clinician raters were apparently more sensitive to the possibility of item bias than even the rather modest criteria (25%) of the sex by race groups were. Items which are often quoted as being biased against minority groups such as the Comprehension item "What is the thing to do if you find an envelope in the street that is sealed, addressed and has a new stamp?" and "If you were lost in the forest in the daytime, how would you go about finding your way out?" were nominated by the Clinician raters, but not by the students. The students tended

to choose those items requiring factual knowledge rather than those items requiring more abstract abilities.

In terms of sex bias the WAIS-R shows little evidence in its item selection with less than 4% of the Verbal items nominated as having sex bias and only one item which is less than 1% exhibiting differential proportions of males and females passing.

Interestingly, the perception of race bias appeared to equally favor whites and blacks with four items nominated as biased for whites and four for blacks. The analysis of the subjects' performance, however, indicated under admittedly non-standard administration conditions that five items were correctly answered proportionately more by whites than blacks, whereas one item was more favorable to blacks than whites.

The implications of this item-level analysis were threefold. First, the clinicians consistent with Sandoval and Miille's (1980) finding seemed to be quite out of touch with the perceptions of the students with regards to bias, even considering the clinicians' decision to be liberal in the item nomination procedure. Certainly, then, clinicians alone should not determine intelligence test item content, however, even the students themselves had only minimal success in predicting biased items. Secondly, at the item level there appears to be some tendency for the items to be answered better by the whites, but even this tendency occurs for only 5% of the Verbal items, or a net advantage of four items. If reliable, this net four point advantage for the whites in the most extreme case would translate into a 5 point Information subtest and therefore a four point Full Scale IQ difference, white ordinarily would more likely result in a one to two point Information subtest and

one to two point IQ difference. Finally, the subjects chose the very obvious items on Information, fully 50% of which were additions to the WAIS. It appears that the items chosen to give the appearance of impartiality are perceived as biased. With the current controversial status of intelligence assessment it would seem that the efforts at making the tests more socially acceptable should avoid culture sampling but rather culture reduce the items.

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Table 1

Number of WAIS-R Items Nominated by Clinicians and Students as Containing Possible Bias by Subtest

Subtest	Number of Items Nominated	
	Clinicians	Students[a]
Information	15	9
Vocabulary	15	1
Arithmetic	7	0
Comprehension	9	0
Similarities	7	0
Total	53	10

[a]N = 398

Table 2

Percent of Sample Passing and Failing
Ten WAIS-R Items by Sex

Item	% Passing		% Failing		Chi^2
	Males[a]	Females	Males	Females	
I-8	92.3	74.2	7.7	25.8	6.29*
I-12	91.4	97.6	8.6	2.4	2.25
I-13	74.5	75.8	25.5	24.2	0
I-14	74.1	71.5	25.9	28.5	.03
I-15	57.7	60.0	42.3	40.0	.01
I-17	67.2	63.4	32.8	36.6	.11
I-18	78.4	78.3	21.6	21.7	0
I-21	44.0	30.8	56.0	69.2	2.15
I-26	34.5	35.0	65.5	65.0	0
V-7	47.2	33.9	52.8	66.1	2.23

*$p < .01$

[a]Males N = 84 Females N = 243

Table 3

Percent of Sample Passing and Failing
Ten WAIS-R Items by Sex

Item	% Passing		% Failing		Chi^2
	Blacks[a]	Whites	Blacks	Whites	
I-8	89.6	79.1	10.4	20.9	2.02
I-12	88.0	98.7	12.0	1.3	8.66**
I-13	57.4	83.8	42.6	16.2	12.69***
I-14	42.0	82.2	58.0	17.8	28.42***
I-15	29.2	69.6	70.8	30.4	22.97***
I-17	78.0	58.6	22.0	41.4	5.32*
I-18	70.2	79.1	29.8	20.9	1.11
I-21	21.7	41.2	78.3	58.8	4.93*
I-26	22.0	36.8	78.0	63.2	3.10
V-7	30.0	70.0	42.3	57.7	1.88

*p<.05
**p<.01
***p<.001

[a]Blacks N = 98 Whites N = 300